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AUTHOR	Meara, Hannah
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ABSTRACT

This paper explores the roots of the concept of mutual adaptation in the literature of cognitive psychology, anthropology, biology, organizational behavior, and policy analysis. It is said that while educational researchers use the concept, their neglect of the literature on it is due, in part, to contradictory definitions of mutual adaptation as both a static and dynamic phenomenon. Mutual adaptation is then explored, based on Piaget's definition of adaptation as a balance between assimilation and accommodation. Writings on individual adaptation of information and of practices are likened to the process described by Piaget. This psychologist's basic conceptualization also is applied to adaptation by school systems, schools, and groups of teachers. Finally, literature focusing on the mutual reinforcement of individual and collective adaptation processes is reviewed, and definitions for various terms are proposed. (Author/GC)

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THE MUTUAL ADAPTATION CONCEPT:

ITS ROOTS AND RELATIVES*

DOCUMENTATION AND TECHNICAL ASSISTANCE

IN URBAN SCHOOLS

Hannah Meara,

Chicago Associates for Social Research

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PROJECT OVERVIEW

The Documentation and Technical Assistance in Urban Schools Project (DTA) is an effort to learn more about how to make urban public schools work better for urban students. Toward this end, DTA combines educational research and practice within one project. DTA's mandate has three interrelated parts:

DOCUMENTATION - to study, using primarily ethnographic techniques, the ways in which selected urban schools organize themselves to solve problems. Documentation focuses upon nine sites throughout the country selected and funded by NIE to continue to engage in locally initiated improvement activities.

TECHNICAL ASSISTANCE - to develop in practice specific strategies which are designed to improve urban public schooling. Technical assistance strategies are based in part upon documentation of useful practices in the nine funded sites.

LINKAGE - to increase understanding, through observation of DTA's attempts to link documentation with technical assistance, of the processes through which research can be useful to practice, and practice can influence research.

This study is a product of the documentation effort. The ideas, commitment, hard work, successes and disappointments of the people directly working within urban schools on a day-to-day basis are in a very real sense the base of DTA. It is our hope that this description and analysis will be useful to researchers, policy planners and particularly to the people who work directly in schools in their efforts to improve the quality and validity of the educational experiences for urban students.

Thomas A. Wilson
DTA Project Director

ABSTRACT

This paper explores the roots of the concept of mutual adaptation in the literature of cognitive psychology, anthropology, philosophy, biology, organizational behavior, and policy analysis, among others. It accounts in part for the neglect of these literatures by educational researchers using the concept by the linguistic mistake made by some anthropologists and dictionary authors of allowing a static as well as a dynamic definition of the concept. The framework for this conceptual exploration comes from Piaget's definition of adaptation as consisting in a balance of assimilation and accommodation. A process like in form to Piaget's is found in writings about individual adaptation of information and of practices. Piaget's basic conceptualization is applied also to adaptation by collectivities such as school systems, individual schools, and groups of teachers. The literature on the adaptation of information and practices by collectivities is reviewed and found to follow the same basic form of experience. Finally, literature focusing on the mutual reinforcement of individual and collective adaptation processes is reviewed. A general definition of terms is proposed which encompasses the various levels of experience.

INTRODUCTION

Mutual adaptation is a descriptive concept in current use by educational researchers, technical assistance specialists, and practitioners. In the context of an analysis of Federally sponsored educational change projects, McLaughlin (1976: 341) defined mutual adaptation as a process "in which project goals and methods were modified to suit the needs and interests of participants and in which participants changed to meet the requirements of the project." The concept is used in an attempt to come to grips with the process by which innovative practices and information can be used to solve problems in education and, particularly, problems in urban public education.

Much of educational research and innovation is not useful in the schools. Even what seems to be highly promising educational innovations are often not used to try to solve school problems. Paradoxically at the same time that a large portion of our collective resources is spent in various approaches to improve public education, the quality of educational experiences for teachers and students alike seems to be in rapid decline.

Where promising innovations in curricula or classroom organization reach local schools, more likely than not, they fail to be used in ways for which they were designed or as part of any meaningful change in the practice of teachers. According

to McLaughlin (1976), this "implementation" problem is generally understood to result from "inadequate operational specificity." She defines the problem in the following way:

> There is a debate concerning who should make project operations more specific, how it can be done, and when specificity should be introduced. . . .
>
> One approach prescribes more specificity prior to local initiation. It is hoped that increased prior operational specificity will minimize the necessity for individual users to make decisions or choices about appropriate project strategies or resources as the project is implemented. . . . It is expected that user adherence to such standardized and well-specified implementation procedures will reduce local variability as project plans are translated into practice and so lead to predictable and consistent project outcomes, regardless of the institutional setting in which the project is implemented.
>
> A second approach takes an organizational rather than a technological perspective and focuses primarily on the development of the user, rather than on the prior development of the educational treatment or product . . . assumes that local variability is not only inevitable, but a good thing if a proposed innovation is to result in significant and sustained change in the local setting. This approach also assumes that the individual learning requisite to successful implementation can only occur through user involvement and direct experience in working through project concepts . . . (p. 349).

McLaughlin (1976) and her colleagues in the Rand Federal Change Agent study (Berman and McLaughlin, 1977a, 1977b; Greenwood, et al., 1975) suggest that situations wherein educational innovations are actually used to solve school problems are characterized by a process which occurs within the second approach in the above quotation, a process which is called mutual adaptation.

In this paper* I will review the literature on the concepts of adaptation and of mutual adaptation and present the various definitions that have been offered. I will show how the extant definitions, while pleasing and promising do not always distinguish between the misuse of the term adaptation as a state and its proper use as a process. A review of the roots and relatives of the term in the literature of several disciplines make this distinction clear. This paper concludes with a view of the concept of mutual adaptation which is informed by previous work and with a brief proposal for its uses in understanding educational processes.

Roots of Mutual Adaptation

Adaptation is a concept laden with a large body of thought representing years of work in the fields of cognitive psychology, anthropology, philosophy, biology, organizational behavior, and policy analysis, among others. Separating the concept from its roots and using it freely has had certain benefits of the sort already indicated, for this term has become a meaningful descriptor for many of us. But this very freedom may have cost us the nourishment which the accumulated work from the several fields just mentioned might provide. Thus, we may ask here

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*The original impetus for this exploration came from the reported experiences of staff members throughout the DTA Project who enthusiastically supported use of term mutual adaptation as a descriptor of educational change experiences they had observed.

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what insights already matured do we want to gather up and take with us as we continue our work to understand mutual adaptation processes? This section represents a first attempt to answer this question.

Two Kinds of Adaptation: A Linguistic Mistake

Basic definitional treatments of the concept (See, for example, International Encyclopedia of the Social Sciences, 1968 and Dictionary of the Social Sciences, 1964) make reference to two kinds of adaptation: the state and the process. In doing so they perpetuate a linguistic mistake. There are features that make adaptation happen and that result from it, but adaptation is essentially a process. It is impossible to imagine the state without the process. Anything one would be tempted to call a state of adaptation would seem to be either the result of the process of adaptation or else a state of readiness to adapt (i.e. to begin the process, or enter into it).

Medawar, the biologist, in his use of the concept "adaptability" comes closest to the state, rather than the process, use of the term. In a lecture on how human and other organisms cope with threatening changes in the environment, he says:

> Coping with sudden attacks by infectious organisms is only one form of a problem that besets all living things: to provide not merely for adaptedness to the environment but for adaptability; to provide not only for what is happening now but for changes which, if the past is anything to go by, are all too likely to happen in the future. Moreover, it is not only a matter of the future. Although we cheerfully speak about the environment of an organism or a population, we know very well there is no such thing. A population of individuals lives in a range of environments, narrow or wide as the case may be; and adaptability is just as much a matter of being adapted to environments which differ from place to place as to environments which change from time to time (1960:44).

His concept "adaptability" suggests a state of readiness to undergo the process of adaptation. But it is dynamic rather than static in its implication of a process of reaction to the constancy of change.

So, too, biologists and anthropologists use the term adaptation in a state-like manner to refer to the state of an organism or a culture which enables it to survive and to reproduce itself in its environment. The anthropologist Cohen, a prolific user of the term, writes: "Every culture is a special case of the adaptive process, of the complex ways in which people make effective use of their energy potentials" (1968:41). Examples of cultural adaptations are "modes of acquiring a livelihood, family organization, social control, settlement patterns and the use of space, and religion . . ." (Cohen, 1968:8). For Cohen, it is the group, the culture, and not the individual which adapts. Adaptation is then observed in the cultural patterns such as hunting and gathering and horticulture (1969:48-49). Kluckhohn (1949:104) uses the term adaptation "as a purely descriptive term referring to the fact that certain types of behavior result in survival (for the individual or for the group)." He makes a distinction between "adaptation (which develops and changes inherited ways of behaving) and adjustment (which develops and changes habits)" (1949:103). But he finds severe limitations in the term adaptation since many cultural ways are choices, any number of which could have likewise promoted survival.

Weiss, the biologist, refers to the confusion over proper definition of adaptation and suggests a solution:

> Right at the start we stumble over the word. . . . To avoid confusion, let us confine the term "adaptation" to the adaptive process only and refer to the adapted state as "adaptedness." Also, and

> while we are on the preliminaries, it may well be pointed out that the term "adapted" always refers to the relation of one entity to another. No system is adapted as such. If this conformance is achieved by direct interaction of the two, we shall speak of "adaptation," otherwise merely of "adaptedness." Adaptation, then, is the fitting, and adaptedness the fitness, through which a system is harmonized with the conditions of its existence (1949:3).

The process of adaptation, then, mediates between a preparatory state and the achieved results ("adaptedness").

The linquistic mistake of treating adaptation as a state, which we find in some of the anthropological literature and in the dictionaries, may partially explain the lack of appeal which the literature has for those who are wishing to use the concept of mutual adaptation to understand implementation of innovations in urban public schools. Conceptualizations of stable states are clearly inapplicable to those fast moving situations. The concept as used in the educational literature refers to a process which facilitates change. We now turn to the various literatures which give theoretical substance to the concept of mutual adaptation. First, we introduce the work of Piaget on adaptation because it is that work which gives form to our understanding of the remaining literature. Then, we review the various writings which may contribute to analyses of educational change efforts.

Piagetian Adaptation and our Scheme for its Application

Our starting place is with Piaget, for his concept of adaptation is a common sensically valid description of individual processes and is also theoretically powerful in its transferability to collective processes. Piaget (1954) constructed his concept of adaptation to describe the core process with which we are concerned:

the incorporation and use of new information by individuals, in our case by educational practitioners. Although he had no intention of generalizing the concept to describe collective processes, we find that it is easy and profitable to do so. We will introduce these ideas in the following paragraphs.

Piaget describes adaptation as a functional invariant in human cognition which occurs throughout the stages of cognitive functioning (e.g., Piaget, 1954; Flavell, 1963). It consists of two processes: assimilation and accommodation. Assimilation refers to the process wherein external objects are structured or restructured so that they fit the ongoing intellectual organization of the individual. Accommodation, on the other hand, represents the process whereby the individual's intellectual organization itself changes to make room for the shape or nature of the external object. The existing intellectual organization permits the individual to function, to apprehend external objects but, functioning properly, it must also take into account the reality of the objects it apprehends and be changed thereby.

Piaget imposes a very stringent requirement upon his definition of adaptation believing that while assimilation and accommodation are constantly happening, adaptation is not. Adaptation happens only when assimilation and accommodation are in balance or equilibrium. A balance of assimilation and accommodation is an ideal; in the complex and difficult world of urban public schools we have to settle happily for much less. Schools, and many other contexts of life, as organizations themselves and as collections of individual participants, are subject to so many currents and forces that Piaget's ideal adaptational state is a rare one indeed and we find that innovations may be introduced, and sometimes beneficially, under less

ideal conditions. We may have to accept, for example, an excess of assimilation wherein a greater variety of educational materials may be available in classrooms and some students may pick them up and find them to be an aid to their learning.

Piaget's (e.g., 1954) notion of adaptation as consisting of assimilation and accommodation provides the basis for our understanding of the remainder of the literature. Flavell, describing Piaget's work, writes that "intelligent activity is always an active, organized process of assimilating the new to the old and of accommodating the old to the new" (Flavell, 1963:17). This is a constant, everyday process which is turned to matters large and small. Flavell explains these core terms in the following way:

> Assimilation here refers to the fact that every cognitive encounter with an environmental object necessarily involves some kind of cognitive structuring (or restructuring) of that object in accord with the nature of the organism's existing intellectual organization. . . . Every act of intelligence, however rudimentary and concrete, presupposes an interpretation of something in external reality, that is, an assimilation of that something to some kind of meaning system in the subject's cognitive organization. . . . And it is Piaget's argument that intellectual assimilation is not different in principal from a more primary biological assimilation: in both cases the essential process is that of bending a reality event to the templet of one's ongoing structure.
>
> . . . intellectual adaptation is no less an accommodatory (act). In even the most elemental cognition there has to be some coming to grips with the special properties of the thing apprehended. Reality can never be infinitely malleable, even for the most autistic of cognizers, and certainly no intellectual development can occur unless the organism in some sense adjusts his intellectual receptors to the shapes reality presents him. The essence of accommodation is precisely this process of adapting oneself to the variegated requirements or demands which the world of objects imposes upon one . . . a receptive and accommodating mouth and digestive system are not really different in principle from a receptive and accommodating cognitive system (1963:48).

This explanation makes clear the essential continuity in the form of the experience throughout biological systems. What is different about educational innovations and their use is that they involve more complex chunks than are usually assimilated and thus require more accommodation from the individuals.

We propose, then, to view the individual adaptation process as composed of assimilation and accommodation. But we also view adaptation by collectivities such as school systems, individual schools, and groups of teachers similarly. In a sense we are exploring the roots of a framework which will guide the collection of data to fill the cells of the following table:

The Adaptation Process

	Individual	Collectivity
Assimilation	Individuals take in new information in terms of on-going thought patterns	Collectivities take in new information and/or structural patterns in terms of on-going patterns
Accommodation	Individuals' on-going thought patterns change to incorporate the shape of the new information	Collectivities' structural patterns change to incorporate the shape of new information or structural patterns

This is the framework which directs our exploration of the roots of the adaptation concept.

One may well question such an approach. Is it valid to transpose concepts intended for the understanding of individual cognition to complex collective interactional situations? We believe that in form the two processes can profitably

be viewed in a similar manner. This occurs for two reasons. First, observation tells us that various living systems have certain formal properties in common and that understanding these properties will enhance our understanding of the behavior of systems. Second, any newly applied framework which organizes our quest for understanding of complex and little understood processes has the potential to enlighten by virtue of its different definition of what to look for and how to explain it.

Support for this approach comes from Bateson's (1971) advice that we advance our understanding, not by uninformed induction, but by attending to the fundamental understandings about form that occur in the scientific tradition. Bateson reports his own early experience with applying frameworks of understanding across topical areas:

> I picked up a vague mystical feeling that we must look for the same sort of processes in all fields of natural phenomena - that we might expect to find the same sort of laws at work in the structure of a crystal as in the structure of society, or that segmentation of an earthworm might really be comparable to the process by which basalt pillars are formed.
>
> I should not preach this mystical faith in quite those terms today but would say rather that I believe that the types of mental operation which are useful in analyzing one field may be equally useful in another - that the framework (the eidos) of science, rather than the framework of Nature, is the same in all fields . . . (p. 74).

Considering how the advance of scientific understanding is furthered by a combination of loose and strict thinking, Bateson suggests that the first application of an analogy from a divergent field has the quality of loose thinking but that the use of the "precise formulations of that other science" (1971:79) is strict thinking indeed.

It provides a new method to explore carefully a process, a new set of rules for what to look for and of how to relate aspects of a process.

We now turn to an exploration of various literatures on the concept of adaptation, making a distinction between those which focus upon individual and upon collective adaptation processes. Adaptation in schools and elsewhere has been considered at both the individual and collective (or organizational) levels. Viewing the individual and the collective as formally alike processes, we hope that reviewing each can lead to progress in understanding the other.

Individual Adaptation

There are a number of different ways in which members of various disciplines have explored processes of individual adaptation. Some have done so by clear intention and others have done so because their efforts to understand collective adaptation have put them in touch with individual adaptors within the collectivities. We have found useful, and will review in this section, work from the fields of psychology, educational change, policy analysis, social psychology, and organization theory.

Hamburg and Adams (1967) employ a conception of human psychology similar to Piaget's in their consideration of how people cope by seeking and using information in major transitions of their lives. Countering an approach which focuses upon human defenses in stressful situations, they describe how people cope by seeking information at stages wherein they can accommodate it, not all at once but some gradually. They write:

> . . . Strategies for obtaining and utilizing such information are formed at all levels of awareness and may be employed over long periods of time. Strategies that are established in a person's psychological repertoire, and that have served similar functions in earlier stressful experiences are likely to be employed first. But distress of higher intensity or long duration is a powerful impetus to the formation of new strategies, integrating internalized orientations and current opportunities. Such new strategies, if effective, are likely to become available for use in future crises and indeed may broaden the individual's problem solving capacity (1967:283).

Like in form to Piaget's conception of cognitive structure and adaptation, Hamburg and Adams write of psychological repertoires or internalized orientations, and of current opportunities.

March and Simon (1958) include some psychological postulates in their theory of organizational behavior. They see behavior as resulting from both the internal state, psychological set, or frame of reference of the individual and from the environment that the individual is encountering (pp. 9-11). We will see later how this psychological approach fits within their theory of innovation in organizations. Symbolic interactionists (e.g., Cooley, 1962; Mead, 1934; Thomas, 1923) see psychological reality as continuously being constructed out of the interaction of remembered past experiences and current perceived events. Mechanic (1970: 115) makes a distinction between habitual and unreflective reactions to commonly encountered stressful events and those which are consciously evident and can be reported to another.

One kind of mental coherence, having to do with the definition of problems for social policy purposes, are frames which are generated from underlying metaphors (Schon, 1977; Wilson, 1976). Frames constrain people to view

problems and their solution in a particular way. When frames are in conflict it is difficult to resolve the conflict by gathering relevant data since what is relevant for one may not be for another. The process of "frame-restructuring" is one solution to this kind of problem and it is also a process which is like in form to the problem which this paper addresses. Schon (1977) describes the process in the following way:

> In the context, then, of a particular, concrete situation, the participants work at the restructuring of their initial descriptions -- regrouping, reordering, and renaming elements and relations, selecting new features and relations from their observations of the situation at hand. As this work proceeds, they represent their experience of the situation through the figural strategies of description, of which story-telling is a prime example. From their figural accounts, they draw the restructured groupings and relations of elements which they are able to embed in a new co-ordinated description (pp. 54-55).

One can also see this process of frame-restructuring as a joint process of Piagetian adaptation. This idea is also at the root of Kuhn's (1962) notion of "paradigm shift." Indeed, Kuhn encourages one to view science as an evolutionary (i.e. adaptational) process.

Considering how to help educational administrators to make successful interventions in schools, Argyris and Schon (1974:3) went from asking what skills and strategies they would need, to thinking about theories of action, that is, theories that determine rather than describe and justify practice. Theories of action are often tacit, unstated, and difficult to change. This inertia is explained "not so much from the inherent difficulty of the new theories as from existing theories people have that already determine practice" (Argyris and

Schon, 1974:3). In the cases of learning a skill and of learning to behave according to a new theory of action "it is essential to practice, to develop and draw on tacit knowledge, and to be in a learning situation that permits a reinforcing cycle of feeling and performance to begin" (p. 14). One's current theory of action is part of that intellectual structure with which one assimilates a new theory of action, or elements thereof. Accommodation to such a theory, in like manner to the process of frame restructuring, does not happen automatically or easily but requires the kind of sustained adaptation effort which Argyris and Schon propose.

Berman, McLaughlin, and others, in their analysis of the Rand Change Agent Study case materials, say much that informs our understanding of the process of individual adaptation. Referring to their learning the new role of teacher in an "open" rather than traditional classroom, McLaughlin (1976:345) writes: Even willing teachers have to go through such a learning (and unlearning) process in order to develop new attitudes, behaviors, and skills for a radically new role." Such a change is not easily achieved and McLaughlin describes how it is achieved in some places and not in others. Along the same line, Berman and McLaughli.. (1977a) write:

> At the classroom level, the crux of the matter is the extent to which teachers have assimilated project methods or materials into their regular classroom practice; unless this assimilation takes place, continuation will amount to no more than ritual (p. II-6).

This process, which Piaget would call accommodation, does not come easily. Major efforts were required of teachers who participated in classroom reorganization projects (p. V-8). And, where there were probably strongly held theories of

action or frames, among teachers with many years of teaching experience, there was little lasting change in classroom practice (p. V-24). Teachers with a sense of their own efficacy, perhaps those who could readily take on the challenge of frame restructuring, were more likely than those who did not have such a sense of themselves, to continue to practice the new classroom strategies (p. V-24).

These various approaches to the problem of individual adaptation take the same form: individuals understand and act on the basis of cognitive or habitual practice structures; change in those structures does not arise effortlessly and comes from an interaction of structure(s) with the environment and its objects. Piaget, more than the others, provides concepts through which the various types of individual processes of adaptation may be understood. His concepts therefore take us farthest to an understanding of individual adaptation as well as providing a framework for investigating the related process of collective adaptation.

Literature on reciprocal socialization lends support to a view of the inevitability of this process of individual adaptation. It focuses upon the mutual influence which occurs in the socialization process, replacing by its work the notion that socialization consists in a one-way process wherein adults socialize children and are not themselves socialized by children. Thomas and Chess (1977), Bell (1964; 1968), and others have studied the influence which infants, their temperaments and behavior, have upon adults, and primarily upon their mothers. They find that mothers make distinct adjustments in their behavior toward infants based upon the qualities of expression of those infants. Hagestad (1974), studying adolescent daughters and their mothers, finds that there are significant areas of

life in which daughters influence their mothers and teach them new ways of being adults. Here too is an area where we had a fairly reliable impression of recipients of socialization as passive in return influence and now begin to understand that they influence in great measure as they are influenced. This process is alike in form to the experience of individual adaptation within schools. Those who are recipients of new information and new practices are also not passive: they influence offerers of information and practice and change the offerings just as they are changed by them. Assimilation and accommodation work jointly at the individual level and at the collective level to which we now turn.

Collective Adaptation

Often referred to as organizational adaptation, collective adaptation is a process whereby groups change from one form of structure or organization to another. Structures or organizations may be of different kinds: theories of action, organizational operating rules and practices, and combinations thereof. Efforts at educational innovation and change are usually directed at collectivities for it is collectivities in the form of school systems, districts, and schools which are responsible for the conduct of educational work.*

Several diverse literatures contribute to our understanding of the collective adaptation process. Anthropology, with its concept of culture and its interest in

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*Notably, some educational change strategies are aimed at individual teachers, concentrating on individual rather than collective adaptation and depending upon the collectivity for support to the individual. See Karunakaran, 1978, for one such example.

culture change, provides a very basic understanding of structures of collectivities. Organization theory, and in particular the work of March and his colleagues, approaches this problem in terms of processes of organizations, and particularly of business organizations. Much that contributes to the current development of our work comes from the Rand Change Agent Study. At whatever level of analysis, the story line is the same: Collectivities take in new information and/or structural patterns in terms of on-going patterns. And the structural patterns of collectivities change to incorporate the shape of new information and/or structural patterns.

Goodenough (1963), writing about an anthropological approach to community development, provides a definition of culture that reveals the structure that it is for collectivities and individuals, and considers some issues in compliance with culture change. Goodenough writes (1963:258) that "anthropologists frequently define culture as the shared products of human learning." These shared products include the following:

1. The ways in which people have organized their experience of the real world so as to give it structure as a phenomenal world of forms, that is, their percepts and concepts.

2. The ways in which people have organized their experience of their phenomenal world so as to give it structure as a system of cause and effect relationships, that is, the propositions and beliefs by which they explain events and design tactics for accomplishing their purposes.

3. The ways in which people have organized their experience of their phenomenal world so as to structure its various arrangements in hierarchies of preferences, that is, their value or sentiment systems. These provide the principles for selecting and establishing purposes and for keeping oneself purposefully oriented in a changing phenomenal world.

> 4. The ways in which people have organized their experience of their past efforts to accomplish recurring purposes into operational procedures for accomplishing these purposes in the future, that is, a set of "grammatical" principles of action and a series of recipes for accomplishing particular ends. These include operational procedures for dealing with people as well as for dealing with material things. (1963:258)

This rather full version of the structure of everyday and of future experience that Goodenough gives us is reminiscent of Argyris and Schon's (1974) theories of action. Culture includes a very elaborate theory of action. It is also a concept that describes this structure of human experience at several different levels of collectivities: the society, the ethnic group, the school system, the school. In all these collectivities experience has been structured by culture. There are "ways" things can and ought to be and these ways are not easily changed. Goodenough (1963) proposes several conditions which effect the degree to which members of a collectivity voluntarily comply with a cultural rule:

1. Compatibility with Other Rules.
2. Consistency with Basic Values.
3. Consistency with People's Self-Image.
4. Applicability.
5. Commitment to the Social Group.

Likewise, these conditions can be seen as applicable to culture change, positing that change will occur more readily where it is compatible, consistent, applicable and where changing individuals are committed to the changing group. In our terms, where new and on-going patterns are compatible or consistent, assimilation and accommodation are simpler to accomplish.

Organization theory provides a similar conception regarding structure and change in collectivities. March and Simon, in 1958, write of organizations as

having a powerful tendency toward continuity over time. When confronted with alternatives they give preference to those which represent continuation rather than change in present programs. They do not consider alternatives to on-going ways unless the course they are following is unsatisfactory; rather than being resistent to change, they are persistent in established procedures (1958:173). By their usage, "not every change in behavior qualifies as initiation or innovation . . ." (p. 174). Instead,

> Initiation and innovation are present when change requires the devising and evaluation of new performance programs that have not previously been part of the organization's repertory and cannot be introduced by a simple application of programmed switching rules (p. 175).

This change is more than a process of choice. March and Simon look more deeply into the process and observe that initiation is a process to be understood, apart from whatever changes follow.

In 1963, Cyert and March conceptualized the business firm as an "adaptive institution" by which they mean that it "learns from experience" (p. 100). The following properties of an adaptive system are alike in form to the processes we are investigating:

1. There exist a number of states of the system. At any point in time, the system in some sense "prefers" some of these states to others.

2. There exists an external source of disturbance or shock to the system. These shocks cannot be controlled.

3. There exist a number of decision variables internal to the system. These variables are manipulated according to some decision rules.

4. Each combination of external shocks and decision variables in the system changes the state of the system. Thus, given an existing state, an external shock, and a decision, the next state is determined.

5. Any decision rule that leads to a preferred state at one point is more likely to be used in the future than it was in the past; any decision rule that leads to a non-preferred state at one point is less likely to be used in the future than it was in the past (p. 99).

The on-going patterns of the organization take precedence over new ways. Environmental changes, called external shocks, occur and change is initiated.

The notion of adaptation is embedded in systems theory regardless of its disciplinary location. Glidewell (1975) defines a social system as:

> an arrangement of people and events into components engaged in an interdependent interchange and modification of resources with each other and the environment in accord with a discernible set of expectations (p.3.1).

He introduces the concepts of entropy and negentropy to describe the relationship between system functioning and the need to take in resources from the environment:

> Entropy is here conceived to be a process of increasing homogeneity of the resources and components within a system; thus, a process of disorganization. Negative entropy (sometimes called "negentropy") is the process of increasing heterogeneity or differentiation within a system, requiring some absorption of energy from the environment. An active system, especially a social system, must absorb more energy from the environment than it returns to the environment (p. 4-1).

And taking in resources from the environment is an adaptation-like process, in Glidewell's terms:

> The internal processing modifies resources so as to make them more valuable or acceptable to the environment than the input was. The value added makes absorption possible while maintaining an equitable interchange with the environment (p. 4-2).

These basic systems theory definitions of system maintenance and change provide a basis from which we can move on to look at the considerably more chaotic social systems of schools.

Cohen, March, and Olsen (1972) isolate and define a particular kind of organization which is interesting for our purposes: an organized anarchy. This is an organization which has the following three properties: (1) it "operates on the basis of a variety of inconsistent and ill-defined preferences"; (2) it has unclear technology in the form of "simple trial-and-error procedures, the residue of learning from the accidents of past experience, and pragmatic inventions of necessity"; (3) its "participants vary in the amount of time and effort they devote" (p. 1). Educational organizations are among those which these authors find to be characterized by these processes. Such organizations do not make decisions on a rational problem-solving basis. Most decisions are handled by flight or by oversight and this process increases as the load of problems to be solved increases. Problem solutions show little carry-over from one encounter to another similar one. Problems are not solved readily and there is no rational relationship between the importance of choices, the importance of problems, and their solution. The model of an organized anarchy has the effect of moderating our anticipation of a unified structure in collectivities; many of the collectivities of interest to us may be loosely-coupled and many may solve problems in an anarchic manner.

The Rand Change Agent Study, focusing directly upon schools and school systems, describes processes and types of organizational adaptation. Their conceptualization of adaptation is related to general systems models based on

computers and on modern theories about organic systems. Systems models "provide concepts for studying complex organizations that are open to their environment and have the capacity to change while maintaining their basic systemic properties" (Berman, et al., 1977b:14). Standard systems models enable them to describe productive adaptation patterns of some schools and school systems. Those systems which were unable to manage adaptation, however, are better characterized as "organized anarchies" and understood in Cohen, March, and Olsen's (1972) terms.

In an early synthesis of findings from the twenty-nine case studies of federal change agent programs, Greenwood and his colleagues (1975: V. III) describe the process of innovation as having three parts: initiation, implementation, and outcomes (pp. 6-7). Projects were initiated either to obtain otherwise unavilable federal funds or because of a specific local need; cases of the former were much less successful in implementation than were the latter because system changes were not initiated.

Berman and McLaughlin (1977a) in a volume concerned with the implementation phase, describe the adaptation process in the following way:

> A key to understanding implementation, then, is adaptation at the user's level. Adaptation of projects in our sample occurred either in the adopted project's design or in the project's institutional setting or in both. . . . Implementation was . . . neither automatic nor assured. An innovation followed one of three processes, defined by the extent to which adaptation occurred in the project and in its institutional setting.
>
> 1. Nonimplementation occurred when the project neither altered its setting nor was adapted to it . . .
> 2. Cooptation occurred where the staff adapted the project, usually emasculating it, to meet their own needs, without any corresponding change in traditional institutional behavior practices . . .
> 3. Mutual adaptation occurred when both project and setting were changed . . . (pp. 8-9).

And the extent of adaptation was related to the project outcomes with significant changes occurring only in the case of mutual adaptation.

In an early volume (1975), Greenwood and his colleagues provide a list of adaptations that were made in most of the change agent projects they studied. We list them in two categories, using the terms of the present analysis:

Assimilation of project to on-going patterns:

- Reduction or modification of project goals
- Amendment or simplification of project treatment
- Reductions in the amount of behavioral change expected from participants
- Reduction of expectations about the impact of the project

Accommodation of on-going patterns to project:

- Changed organizational patterns
- Learning new skills or attitudes

They did not find projects which accomplished accommodation without assimilation.

In a later paper (1977b) Berman and his colleagues use a related but alternative conception of types of organizational adaptation: maintenance, development, and decay. Maintenance is where schools "altered management practices, adopted educational technologies, and so on, but did not significantly change core organizational beliefs and structures that affect student learning. This form of adaptive behavior seemed to reflect and reinforce the stability of the school district organization. . . . It served to maintain the status quo of core educational processes . . ." (pp. 4-5). The other two types of organizational adaptation were defined in the following ways:

> Organizational development was the label applied to school districts which had "begun to adapt to their particular pressures so as to consistently implement and sustain profound change that may improve educational performance. The key to this adaptive behavior lies in those organizational beliefs and structures which allow the school districts to routinely re-examine and renew some elements of their core educational processes . . . . They developed . . . as the result of deliberate efforts . . .
>
> Organizational decay is a transition state wherein, in the case they studied, the "district's community is polarized along ideological lines, and the resulting split has politicized the school system and imposed new priorities on its educational program. Consequently, the long-term effectiveness of the district's educational delivery is in jeopardy (p. 4).

It is interesting to consider this typology in the light of the Piagetian concept of adaptation. Development a[illegible]utual adaptation may be situations where assimilation and accommodation are more or less in balance. Cooptation and maintenance may be processes characterized by an excess of assimilation over accommodation. Decay is, perhaps, a case of distraction from possibilities of assimilation and accommodation of project and on-going patterns in favor of an organized anarchic response of assimilation and accommodation with regard to perceived external threat. (The missing analytic category - an excess of accommodation over assimilation - may be applicable to situations where teachers and administrators are overly enthusiastic about and use the rhetoric of some new educational methods without knowing how properly to apply them within their own system and with their students).

A central issue in the types of maintenance and development is the structure and related stability of the organizations. Following are the characteristics which Berman and McLaughlin (1977b) attribute to each:

Maintenance	Development
delivery uniformity	delivery diversity
loose-coupling	integrated loose-coupling
subordination of delivery to bureaucratic and political concerns	primacy of delivery concerns
closed boundary in attempt to seal off from outside pressures and influences	boundary openness
stability as a constraint - discouragement of risk taking	institutionalized change

These two types of organizational adaptation differ in the way in which they maintain the integrity of their structures. In the situations characterized by maintenance, structural stability is a defensive process. The structure of situations characterized by development is integrated around the processes of assimilation and accommodation, and the parts of the system are interconnected by these processes. The situations characterized by maintenance seem to be the common ones to which Cohen and his colleagues apply the label of organized anarchy with all the attendant problems they describe.

Berman (1978), analyzing implementation processes, underlines this point of the prevalence of on-going structures in organization behavior, writing:

> 1. stable organizations, whether public bureaucracies or private firms, implement standard decisions in a programmed and predictable, if not optimal or desirable, way . . . but
> 2. implementation becomes problematic when an organization confronts a nonstandard decision that implies a departure from routine behavior (pp. 162-163).

Essentially, schools and other organizations operate using standard routine behavior. Implementation of a new policy to the local setting and changing the standard procedures of the local organization.

Whatever their adaptation processes, organizations and other collectivities work them through their agents of thought and action: the individuals who hold organizational positions. And, also, individuals adapting, cognitively and in practice, are affected by the nature of the collective processes within which they exist. The following section deals with this interaction between individuals and collectivities.

Mutual Reinforcement of Individual and Collective Adaptation

Many of those whose work has been described above confine their domain of interest either to individual or to collective processes. It seems to us likely, however, that to do so is to miss a significant aspect of adaptation processes: that there is mutual reinforcement between individual and collective adaptation.

Toulmin (1972), a philosopher of science, writes of the "problem of human understanding" as "the problem of accounting for the intellectual authority which our collective methods of thought exert over individual thinkers" (p.1). Collective methods of thought provide the form with which the individual can express, and change in understanding comes about through progressive transformation (p. 122). Collective concepts develop or change through both innovation and selection. Innovation has to do with the "factors and/or considerations (which) lead the bearers of (a) tradition to propose certain ways of moving away from the currently

accepted position" (Toulmin, 1972: p. 122). Selection factors and/or considerations are those which "lead them to accept certain of these innovations as established in preference to others, and so to modify the collective conceptual tradition" (p. 122). Pointing out the similarity between conceptual change within science and within practical crafts and technologies he writes the following, which seems readily descriptive of the process of educational innovation:

> In each case, we are concerned with the historical evolution of a "transmit" of population of procedures. In each case, the apprentice qualifies for his profession by accepting its collective ideals and mastering its current procedures. In each case, the index of his proficiency is given by a demonstrated grasp of these ideals and procedures and of the uses to which they can be put. In each case, the current procedures are themselves subject to a critical process of innovation and selection, in the light of the disciplinary ideals. And, in each case, the overall process of disciplinary evolution is a locus for the operation of both "causal factors" and "rational considerations" (p. 365).

Educational pracitioners then, out of a background of on-going practice, select or are assigned innovations for use. For Toulmin, this process is evolutionary rather than revolutionary and not dissimilar to the Piagetian process of adaptation. What is unlike Piaget, is Toulmin's (1972:37) emphasis on the function of collective methods of thought as providing the materials without which the individual adaptational process cannot occur.

Working out these matters in a complementary manner, Mechanic (1974) writes:

> . . . abilities to cope with the environment depend on the efficacy of the solutions that his culture provides, and the skills he develops are dependent on the adequacy of the preparatory institutions to which he has been exposed . . . . To the extent that preparatory and evaluative institutions

> in a society are fitted to the types of problems people in the society must face, then most persons are likely to acquire the skills and capacities to meet life demands and challenges . . . . As solutions to important problems become more complex, these problems are less likely to be resolved by individual initiative and action. In contrast, they are likely to depend on the ability . . . to work out organized solutions involving group actions (pp. 33-36).

In complement, Goldschmidt (1974) views cultural diversity as resulting from the different ecological circumstances in which they exist and writes that it is cultures which "provide, or should provide, institutional means for individual adaptation" (p. 13).

Neisser (1962), writing about cultural and cognitive discontinuity states that cognitive reorganization which occurs to a significant number of people at the same time must come from "modifications in their way of life; that is, it will be part of a culture change" (p. 70). And conversely, he states: "we can safely assume that any substantial change in culture will require accommodative cognitive change in its participants" (p. 70).

Toulmin, Mechanic, and others are pointing to the most basic aspect of the mutual reinforcement of individual and collective adaptation: that these two processes are essentially interwined. But there is another way in which mutual reinforcement occurs, one which is not so closely tied to the nature of human communication and thought development and more to the nature of human interactional processes. In this other way, when individual adaptation takes place it gives some impetus to adaptation on the part of others in the collectivity of which the individual is a part. It also means, and this we want to stress, that

collectivities differ significantly in the support they offer for individual adaptation and that one of the most significant kinds of support in this regard may well be the carrying out of collective processes of adaptation. At a subliminal level it may well be that individual cognitive adaptational processes pick up support or find a supportive mirror in collective adaptational processes. Being in a school where information is taken in and positive changes are made and where participation in such changes is rewarded may be just the impetus required to make of potential adaptors, actual ones.

There is some support for this view in the literature on what happens within millenial movements when the predicted day of judgement does not occur. Festinger and his colleagues (1956) observed processes which fit within the rubric of mutual reinforcement of individual and collective adaptation. Members of the group they studied were located in different types of collective situations when the predicted date of the millenium occurred and there were great differences in their experiences in line with the collective situations in which they found themselves. Those who were with other members of the millenial group had their beliefs reinforced by the support which other group members gave. Members who were isolated from other group members lost the faith much more rapidly. Collective support from other millenial group members reinforced the cognitive process in individuals.

Argyris (1964) takes the position that the two levels are mutually reinforcing:

> . . . we believe that organizations and personalities are discrete units with their own laws, which make them amenable to study as separate units. However, we also believe that important parts of each unit's existence depend on their connectedness with the

> other. We hypothesize that one cannot fully understand the individual without understanding the organization in which he is embedded and vice versa . . . (p. 13).

He also believes that challenges that test and develop peoples' selves come from incongruence between individuals and organizations (p. 7). Individual innovators stand apart within their organizations but they also count upon collective interactions for support and sustenance.

Within organizations such as schools, then, individual adaptation is prescribed, reinforced, and elicited in greater or lesser amounts or not at all. What is possible for individuals is affected, in large measure, by the presence and state of adaptation processes in the collectivity. The concluding section will summarize, analytically, these various adaptation processes, how they fit together, and their relevance for understanding school change processes.

In Conclusion: The Basic Concepts and their Applicability

Adaptation is a process relating an entity and an environment. The entity is presumed to have an internal structure to which features of the environment can be assimilated and which itself is capable of change. If the entity is an individual, then part of its structure may be determined by certain collectivities in which it is nested. Conversely, if the entity is itself a collectivity its structure may be determined, at least in part, by the individuals of which it is composed. Mutual adaptation occurs as a process relating two (or more) entities, each of which provides part of a changing environment to which the other (s) adapt.

We now have some analytic tools for understanding and affecting change processes in schools.* Assuming that change will bring about improvement in the learning experiences of school children (or, at least, that a substantial proportion of induced changes will bring about such improvements), we will expect it to come about through a process of mutual adaptation between school systems, teachers, and their practices and assistance groups, innovations, innovators, and assistance specialists. We will not expect innovations to be adopted unchanged and will even assume that the more thorough-going the changes, the more thorough the use that will be made of innovations. For teachers and schools are not empty big boxes into which new little boxes can be placed and from which old little boxes can be removed. They are complex, nested structures with a history of educational practices and their on-going validity must be recognized by those who would succeed in the promotion of change.

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*A first attempt (Meara, 1980) to apply these tools is made in an analysis of data on educational change efforts which were collected for the DTA Project.

REFERENCES

Argyris, C. Integrating the individual and the organization. New York: Wiley, 1964.

Argyris, C., & Schon , D. A. Theory in practice. San Francisco: Jossey-Bass, 1974.

Bateson, G. Steps to an ecology of mind. New York: Ballentine, 1972.

Bell, R. A. The effect on the family of a limitation in the coping ability of the child. Merrill-Palmer Quarterly, 1964, 10, 129-142.

Bell, R. A. A reinterpretation of the direction of effects in studies of socialization, Psychological Review, 1968, 75, 81-95.

Berman, P. The study of macro- and micro-implementation, Public Policy, 26, no. 2, 1978.

Berman, P., & McLaughlin, M. Implementing and sustaining innovations, Manuscript, Rand Corporation, 1977a.

Berman, P., & McLaughlin, M. Adaptation with and without change: maintenance, development and decay of school districts, Manuscript, Rand Corporation, 1977b.

Cohen, M. D., March, J. G., & Olsen, J. P. A garbage can model of organizational choice, Administrative Science Quarterly, 17, no. 1, 1972.

Cohen, Y. The conceptualization of culture. In Y. Cohen (Ed.), Man in adaptation, the cultural present. Chicago: Aldine, 1968.

Cooley, C. H. Social organization. New York: Schocken, 1962.

Cyert, R. M., & March, J. G. A behavioral theory of the firm. Englewood Cliffs: Prentice-Hall, 1963.

Dictionary of the social sciences, W. L. Kolb & J. Gould (Eds.), New York: Free Press, 1964.

Festinger, L., Riecken, H. W., & Schachter, S. When prophecy fails. Minneapolis: University of Minnesota, 1956.

Flavell, J. H. The developmental psychology of Jean Piaget. Princeton: D. Van Hostrand, 1963.

Glidewell, J. C. A model for the analysis of social systems, Manuscript. The University of Chicago, 1975.

Goldschmidt, W. Ethology, econolgy, and ethnological realities. In C. V. Coelho, D. A. Hamburg, and J. E. Adams, Coping and adaptation. New York: Basic Books, 1974.

Goodenough, W. H. Cooperation in change, an anthropological approach to community development. New York: Russell Sage Foundation, 1963.

Greenwood, P. W., Mann, D., & McLaughlin, M. W. The process of change, V. 3 of Federal programs supporting educational change. Washington, D. C.: U. S. Office of Education, Department of Health, Education, and Welfare, 1975.

Hagestad, G. Middle aged women and their children: explaining changes in role relationship. Unpublished doctoral dissertation, University of Minnesota, 1974.

Hamburg, D. A., & Adams, J. E. A perspective on coping behavior: seeking and utilizing information in major transitions, Archives of general psychiatry, 17, 277-284, 1967.

International encyclopedia of the social sciences. D. L. Sills (Ed.), New York: Macmillan, 1968.

Karunakaran, C. Life and work in several urban communities: a case study of open education, Manuscript. Chicago: Center for New Schools, 1978.

Kluckhohn, C. The limitations of adaptation and adjustment as concepts for understanding cultural behavior. In J. Romano, (Ed.), Adaptation. Ithaca: Cornell University Press, 1949.

Kuhn, T. S. The structure of scientific revolutions. Chicago: The University of Chicago Press, 1962.

March, J. G., & Simon, H. A. Organizations. New York: Wiley, 1958.

McLaughlin, M. W. Implementation as mutual adaptation: change in classroom organization. Teachers college record, 77, no. 3, 1976.

Mead, G. H. Mind, self, and society. Chicago: University of Chicago Press, 1934.

Meara, H. Mutual adaptation: Using outside information in educational practice, Manuscript, 1980. Chicago: Chicago Associates for Social Research.

Mechanic, D. Social and psychological factors in stress. In J. McGrath, (Ed.), Social and psychological factors in stress. New York: Holt, Rinehart & Winston, 1970.

Mechanic, D. Social structure and personal adaptation: some neglected dimensions. In G. V. Coelho, D. A. Hamburg, and J. E. Adams, Coping and Adaptation. New York: Basic Books, 1974.

Medawar, P. B. The future of man. New York: Basic Books, 1960.

Neisser, U. Cultural and cognitive discontinuity. In the Anthropological Society of Washington, Anthropology and human behavior. Washington, D. C., 1962.

Piaget, J. The construction of reality in the child. New York: Basic Books, 1954.

Schon, D. A. Generative metaphor: a perspective on problem-setting in social policy, manuscript, June, 1977.

Thomas, A. & Chess, S. Temperament and development. New York: Brunner-Mazel, 1977.

Thomas, W. I. The unadjusted girl. Boston: Little, Brown, & Co., 1923.

Toulmin, S. Human understanding, I. Princeton: Princeton University Press, 1972.

Weiss, P. The biological basis of adaptation. In J. Romano, Adaptation. New York: Cornell University Press, 1949.

Wilson, S. H. The importance of shared cognitive frameworks to the sustained improvement of urban schools, manuscript. Chicago: Center for New Schools, 1976.